

**12/17/2001 Surrebuttal Testimony of John I. Hirshleifer
on behalf of AT&T and WorldCom
Docket D.T.E. 01-20**

1 base, second base, utility player, etc.). One would expect to see at least 9 different
2 independent variables in the regression to separately evaluate cross-sectional data across
3 all teams *for each player position*. Using a single independent variable that represented
4 an average of player batting averages across all field positions, by contrast, sheds no light
5 whatsoever on the cross-sectional contributions of players by position to team victories.

6 A further problem with Verizon's regression analysis is its use of linear function
7 forms. As evidenced by its name, a linear regression implicitly assumes that the
8 dependent variable (in this case, the P/E ratio) is a straight-line function of the
9 independent variables (such as the growth rates). This means that changes in the
10 **independent variable are assumed to cause the dependent** variable to change at a
11 constant rate.

12 Dr. Vander Weide's unrealistic one-stage DCF model does in fact simplify
13 algebraically into a linear formula: $K_e = D_1/P_0 + g$. A linear formula lends itself better to
14 tests using linear regressions. But more realistic growth rate assumptions (such as those
15 proposed by reputable scholars in the economic literature that I have cited, or those used
16 in DCF valuations of companies by securities analysts), assume changing growth rates
17 over time. Pictured graphically, these growth expectations describe a non-linear curve,
18 rising during the high-growth period, flattening and/or declining over a transitional
19 period, and then flattening into a straight line during the stable growth period. This is not
20 the straight-line relationship that a linear regression assumes and tests. Unlike the single-
21 stage DCF model, the more realistic models which use differing expectations of growth